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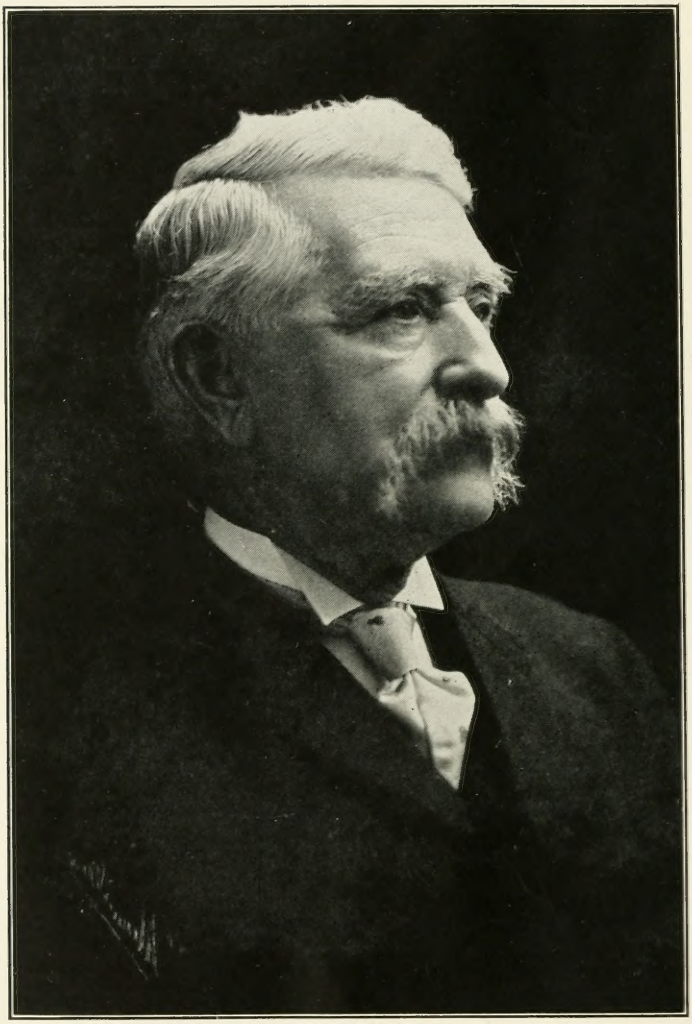

RICHARD H. STRETCH.

ENTOMOLOGICAL NEWS

AND

PROCEEDINGS OF THE ENTOMOLOGICAL SECTION

THE ACADEMY OF NATURAL SCIENCES, PHILADELPHIA.

VOL. XXXI. JULY, 1920. NO. 7.

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Richard H. Stretch---An Appreciation.

By KARL R. COOLIDGE and H. H. NEWCOMB,

Los Angeles, California.

(Plate II)

There remain today but few of the pioneer lepidopterists who, mostly under great handicaps, laid the ground work for this study in America. Grote, Behr, Henry Edwards, Scudder, William H. Edwards and others have passed to the Great Beyond, leaving behind them writings and memories that will forever be monuments to their genius. An associate of these men, and himself *the* pioneer lepidopterist of the Pacific Coast, is Richard H. Stretch, who for some years has been living at 2657 37th Avenue, S. W., Seattle, Washington. As he has been wintering at Pasadena, California, we have been privileged to make his personal acquaintance, and from

him we have gleaned the following facts of his life. And when but recently he remarked to us that he could hardly understand why any one should be interested in his life's work, that—"I have done so little"—we were amazed. But let us sketch briefly the busy career of this man, whose labors are still far from being ended.

Richard H. Stretch was born November 25th, 1837, at Nantwich, England, five miles from the Crewe Station in Cheshire. His father died when he was eight years old, and two years later he was sent to a Quaker boarding school at Ackworth. At fourteen he attended the Friends' School at York. Even in these early years he had an intense interest in Natural History, but especially insects.

In 1853 he went to Banbury as an apprentice in a draper's shop, remaining there until 1859. But this existence did not appeal to him (he states now that he had as much interest in dry goods as a fly) and the following year he held a position as cashier and book-keeper in a manufacturing company. In the winter of 1861 came an invitation to visit relatives in Illinois, and always eager to travel, and seeing an opportunity to study new forms of insect life, he quickly accepted this chance, soon leaving for Boston on the old Cunard side-wheeler "Canada," the passage consuming twenty-one days. Reaching Boston, he proceeded to New York, and from there by steamer to Panama. There he did considerable collecting in all lines, and became acquainted with Dr. White, of the Panama Railroad Company, the pioneer coleopterist of Central America. Leaving Panama, he made New Orleans his next stop, remaining there several weeks sight-seeing and, as always, collecting. Thence to his uncle's home, near Adrian, Illinois, where he remained about a month. Deciding to return to England, he made hurried visits to Philadelphia and Washington and then voyaged to Europe.

The following year he devoted himself to architecture and building, but was dissatisfied with conditions and again came to the United States. He visited once more his uncle in Illinois, making considerable collections in all lines of biology. In 1863 he joined an emigrant party bound for California, and it was during this that a curious incident occurred.

Mr. Stretch's party consisted of but five, a very insufficient number in view of the numerous hostile Indian bands. But while other and larger emigrant groups were attacked, and in some cases, wiped out, this small party passed unmolested. At the outset of the journey one of Mr. Stretch's collecting bottles, containing a various assortment of insects in alcohol, had rolled from one of the wagons unobserved. A friendly Indian had found and returned it. Mr. Stretch displayed his entomological wares to this red skin, who viewed them with intense interest, but not in a scientific way. And all along the line of the emigrant trail word was passed among the Indians that a Big Medicine Chief was coming, and apparently orders were given that no harm should befall him.

Arriving at Salt Lake City, Mr. Stretch altered his plans and proceeded to Virginia City, then a rip-roaring frontier mining camp. First employed as a cook, he later ran a saw mill, and after that became associated with a Mr. Chapman in a land office business.

Here again his entomological knowledge served him well, for his eye, trained in the discrimination of minute differences, also permitted him with ease to grade the various types of ore. And then, to his astonishment, he was elected state mineralogist of Nevada. He says now that it was with many misgivings that he undertook the duties required of this office, for his knowledge of mining was very scanty. But close observation and study overcame that, and eventually he became known as the best maker of mining maps in America.

In 1867 he journeyed on to California, being among the earliest of the emigrants to cross the fearful Death Valley, meeting with Indians who had never before encountered white men. It was in this year that he introduced the method of making squares on maps, marked A. B. C. and 1, 2, 3, etc., now used the world over. He visited San Francisco, and also descended into Chihuahua, Mexico, to examine an old mine. Those were the days of hardships in travel, and Mr. Stretch recalls now, laughingly, one incident in particular when the food supply gave out, and he and the other members

of his party were forced to subsist for two weeks on lizards and prickly pears.

In the winter of 1868–69 he returned to Virginia City for the U. S. Geological Survey to make a study of the famous Comstock lode. His celebrated maps of this lode are to be found in the Encyclopedia Brittanica. But, with all his pressure of business, his interest in entomology never flagged, and many new and interesting species resulted from his Nevada stay.

Returning to San Francisco, he spent the next few years in surveying, in 1870 becoming City Surveyor of San Francisco, Near Fresno, he sank the first artesian well in California, reaching a depth of 500 feet. He also put in the headgate of the first irrigation ditch in the state, this near Kingsbury.

In 1874, Mr. Stretch paid a visit to his old home in England but returned to California in the following year, spending the next two years at Havilah, in Kern County. Here the dainty *Philotes speciosa* was discovered and named by Henry Edwards, as were a number of other butterflies taken at Havilah. In 1888 he removed to Seattle, Washington, and from there mining engagements took him to nearly every state in the west, as well as to British Columbia. He laid out West Seattle, was chief engineer of the Seattle and Southern Railroad, and also, in later years, spent some time at Skaguay, Alaska, as engineer for the White Pass and Yukon Railroad.

In 1885 his wife, whom he had married at Virginia City, passed away and shortly after Mr. Stretch donated his entomological library, rich in valuable works, to the Mechanic's Institute in San Francisco. His magnificent collection, replete with many types and rarities, and numbering about thirteen thousand specimens, he gave to the University of California, at Berkeley, California.

Through all these busy years, Mr. Stretch kept up a world-wide correspondence with entomologists. He was elected a member of the California Academy of Sciences and the Philadelphia Academy of Natural Sciences. A constant contributor on entomological subjects, his many papers are

to be found in Papilio, Canadian Entomologist, Entomologica Americana and other journals. He was called, while at San Francisco, to investigate the Cottony Cushion Scale, then present in but one spot in California, at San Mateo, and his exhaustive report of this was published by the California Academy of Sciences. In a recent letter Mr. Stretch writes concerning the warning note he gave in this paper: "This warning was utterly disregarded, when if appreciated it would have saved millions, as I pointed out what might be the result of inaction to prevent spread."

Though Mr. Stretch knew the butterflies and collected many new species, his greatest interest was in the moths, and his "Illustrations of the Zygaenidae and Bombycidae of North America," published in 1872 and 1873, will remain as a classic of those groups.

He knew intimately not only the other early entomologists of the west, but many other men of note. Edison he visited when that genius was at work on the first phonograph. He was well acquainted with Mark Twain, and recalls with mirth the celebrated lecture by the famous humorist upon his return from the Hawaiian Islands—in which not one word was uttered of the islands he had just visited, the announced subject of the lecture. But Henry Edwards was Mr. Stretch's closest friend and companion, and when, in the early nineties that perfect gentleman passed on, Mr. Stretch's active entomological studies practically came to an end.

At the present time, at the age of eighty-two, he is engaged upon a mining hand book. A former treatise of the same subject is still the standard in many universities.

And yet, with so much accomplished, Mr. Stretch confesses that his ONE GREAT AMBITION was never realized—to collect tropical butterflies. "Ah, the dreams of youth departed" he said regretfully as he looked upon some gay exotics, but we are not so sure—it would not surprise us at all should we learn that Mr. Stretch had gone to the tropics to perch in tree tops, and as he had once hoped to do, to shoot with a blow pipe the gorgeous Morphos!

The Genus Choranthus Scudder, with a Description of a New Species (Lepidoptera.)

By Henry Skinner.

This genus was proposed by Dr. Scudder in the Annual Reports of the Peabody Academy of Science, 1871, p. 79. The genus was not described. The type cited was *Hesperia radians* Lefebv. in Sagra Hist. L'Ile de Cuba, 1857, p. 650. Watson in his "A Proposed Classification of the Hesperidae," Proc. Zoological Soc. Lond., 1893, p. 130, did not know the genus. Mabille in the Genera Insectorum (Hesperidae), 1904, does not mention either the genus or species. The original description of *radians* is not very good but there is no doubt about the species intended. A description of the species will probably be useful as the genus and species have been confused with the genus *Atrytone* Scudder and its species.

Choranthus radians.

♂.—Expanse (one wing) 14 mm. General color of wings, body and legs, above and below, fulvous. Antennae fuscous above and on the underside of the ends of the club; inner half of the club below, fulvous; underside of the shaft annulated. Palpi above fulvous, mixed with black, below tawny. There is a patch of yellow hairs at the base of the antennae.

Upperside. The primaries have a v-shaped black line at the end of the discoidal cell. The stigma is a narrow black line 4.5 mm. in length, the upper end pointing toward the apex of the wing and the lower end resting on the submedian nervure. A fuscous border 4 mm. wide on the costa and 2.5 mm. wide at the middle. The fulvous of the wing extends into the border finely dentate. The secondaries have the same fuscous border, 2.5 mm. wide on the costa and 1 mm. wide on the outer and inner margins.

Underside. Primaries: The base, except on the costa, fuscous. Marginal band as above, but olive green, with the nervures extending into it as rays. Inner margin olive green. Secondaries olive green with the nervures fulvous, except the space between two of the median nervures, which is fulvous.

The female is marked like the male but it lacks the sex brand and it is a little larger.

The species is found in Cuba and I collected some specimens of it during the month of February near Guantanamo. I described the species as *streckeri* in Ent. News, 1893, IV,

211, the specimen having been said to be from Florida. See Ent. News, 1917, XXVIII, 82. Dr. F. D. Godman, Ann. Mag. Nat. Hist., 1907, XX, 144, cites *magica* Ploetz, as a synonym of *radians*.

Choranthus haitensis n. sp.

The description of *radians* will answer for this species. It differs as follows. *Upperside*: Primaries: Nervures black, the fulvous not dentate into the fuscous border. Secondaries: Fuscous border entire. *Underside*. Primaries entirely fulvous, excepting the base and the border of the inner margin. Secondaries entirely fulvous.

Described from a number of specimens from Haiti and San Domingo. The only definite localities are Samana Bay, San Domingo, (Dr. W. L. Abbott) and the *type* male from Port de Paix, Haiti, VII, 27, 1917, (Dr. W. L. Abbott) and a female with the same data.

The sex mark distinguishes these two species from any Pamphilinae known to me. *Type* in the collection of The Academy of Natural Sciences of Philadelphia.

Notes on Gonatopus ombrodes, a Parasite of Jassids (Hymen., Homop.)

By C. N. Ainslie, U. S. Bureau of Entomology.

(Continued from page 173).

It may be worth while to note here that the body of the larva after emergence is so much greater in bulk than the capacity of the sac that it is plainly evident it must occupy much of the abdominal chamber of the jassid, using the sac possibly as a spare room into which to expand as growth adds to the volume of the body.

The Cocoon

When ready to construct the cocoon, and this usually follows closely on emergence, the larva seems best satisfied to select the groove of a curled grass blade or even to locate on a flat blade, and there, with its body parallel to the axis of the leaf it makes its cocoon. The silk of which the cocoon

is fashioned is of such very fine texture that a single thread is almost invisible except when placed in a strong light. When the larva leaves its host it sometimes spins a few threads as it moves away, but these are meaningless and are soon abandoned. After more or less travelling about, in captivity, a location for the cocoon is decided upon and a first move made by fastening a few delicate threads in front of the head. The silk issues from a spinneret near the mouth. By swinging the head backwards and sideways, points of contact for more threads are secured and soon a filmy fabric or awning begins to envelop the larva. Hour after hour the spinning progresses on the inside of the chamber without a minute's delay as if the naked helpless larva were making frantic efforts to clothe itself as soon as possible. The spinner reverses ends within the cocoon whenever necessary to distribute the silk properly. When complete the cocoon is quite dense, nearly or quite opaque and is snow white. It measures, over all, about 6 millimeters long and 1 millimeter broad at the widest part. The cell proper that contains the larva and afterwards the pupa is only 4 millimeters in length. On each end of this is a sloping addition more transparent than the main structure, a tapering web, the entire affair somewhat resembling an inverted hammock in shape.

These cocoons are not difficult to find in the open since they are very white and are usually placed prominently near the tips of grass blades in plain sight, on the upper side of the leaf. Occasionally they are found attached to stems of grasses or among the vegetable rubbish near the ground. On one occasion an *ombrodes* larva emerged in captivity and locating on a grass blade spun for itself a very fine, nearly transparent screen of silk. Two very minute ants that happened to have been introduced into the cage with some earth were seen feeding upon this silk fabric and they nearly denuded the larva before they could be driven off. The larva did not mature but gradually dried up without moving.

The adult emerges through an irregular opening that is chewed in one end of the cocoon. A period of ten to twelve

days elapses from the emergence of the larva to the appearance of the adult.

The Adult

August 21, 1914 an adult emerged from a cocoon that was begun August 10th. She was black, wingless, had enlarged anterior femora and the usual chelate tarsi. At first glance she exactly resembled a very active ant. When first seen she was racing wildly about the vial, pausing at times for a careful preening. To see what would happen I introduced three living and active *Cicadula 6-notata* into the tube with this adult. As the three moved down the cage toward the lighter end of the vial the dryinid sprang at them and captured the least active individual. She caught it at right angles, bent her body around beneath the body of the jassid and apparently attempted oviposition. She soon left this one, approached one of the others with her antennae in rapid motion before her, touched it with the tips of the antennae and threw the antennae back against her thorax, stiffly for a second or two, repeating this operation several times. This backward antennal gesture gave her a startlingly fierce and tigerish expression. Presently she made a spring, grasped her victim with her jaws and chela and curved her abdomen under its body as if searching for a place to penetrate with the ovipositor. Beginning at the neck she gradually worked down across the thorax until she reached the opening between the second and third segments of the abdomen when the tip of her abdomen was thrust in and held there for at least a minute. Meanwhile the jassid was lying limp and helpless, and without any effort to escape. While ovipositing the parasite appeared to be chewing on the jassid's thorax but seemingly did no harm. When released the jassid shook itself, seemed much disturbed by the attack, but in a few minutes was as lively as ever. Time did not permit of dissection to learn if an egg had actually been placed.

Similar attacks have several times been observed. The parasite usually steals slowly up on her prey with quivering antennae, at times throwing these rigidly back against the

thorax, giving her a most vicious expression. When near enough she makes a quick spring and seldom misses. All these observations were made on individuals in captivity. Without doubt the same method is used in the open, her resemblance to an ant perhaps making approach more easy. In a number of instances these adults have been seen to feed on jassids after capture, sinking their jaws into the thorax of the captive and devouring ravenously, killing it in the operation.

From an economic standpoint this species must be regarded as distinctly beneficial although as a control measure it can be of little real value since it normally occurs in very limited numbers.

Oviposition by a Cockroach, Periplaneta americana Linn.* (Orth.).

By V. R. Haber, Research Assistant in Entomology, University of Minnesota.

Little detailed information concerning the egg placing habits of our common cockroaches is recorded. For this reason it seems desirable to record these observations made upon the oviposition habits of the American cockroach, *Periplaneta americana* Linn.

As is characteristic of most of the species of cockroaches or Blattidae, *Periplaneta americana* Linn. is nocturnal. Thus it was necessary to continue observations during the entire night.

A cage was provided in which to confine the roaches during observation. It consisted of a wide mouthed candy jar of about two gallons capacity. Inside upon its bottom rested small slabs of corrugated pasteboard, each leaned slantwise against the wall of the cage. During observation the cockroaches were fed with freshly killed individuals of the same species, bread and water.

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Into the cage thus provided were placed four females, each bearing an egg mass or oötheca protruding from the external genital orifice of the female reproductive tract. The mouth of the jar was completely covered with a slab of cardboard. Observations made during three successive nights failed to yield results, but on the fourth night the following observations were made.

At approximately 2:50 A. M. an individual with her mandibles began to scar and roughen the surface of the pasteboard slab which had been introduced into the cage to serve as material upon which to oviposit. She chewed and munched at the upper surface of the pasteboard until she had made quite an appreciable dent or groove there, not dropping the bits of pasteboard upon the bottom of the cage but mixing them by means of the mouth parts with a secretion from the mouth until they became a damp mass. This mass of finely chewed pasteboard stuck to the surface of the pasteboard from which it was chewed.

At about 3:20 A. M. she crawled *forward* over the scar with her abdomen bent anteriorly and ventralward, probing about with the protruding oötheca until she located the scar which she had made. Then she dragged the oötheca into it, but the scar being too shallow the oötheca rolled out and fell to the floor of the cage. The female turned about and with her palpi sought for the oötheca. Finding it missing, immediately she ran down the pasteboard, seized the oötheca by its flanged edge with her mandibles, straddled it with her front legs, and thus carrying it returned to the scar. Upon replacing it into the scar again she was unsuccessful at keeping it there, for the oötheca dropped to the bottom of the cage. A second time she ran down, seized the oötheca as she previously had done and set out to locate the scar. She ran up almost to it, then becoming confused ran around to the opposite side of the pasteboard, ran confusedly about, stopping at intervals and holding the oötheca clasped between the femur and tibia of one front leg, seemingly to rest. Again the oötheca slipped from her grasp and fell. This time it bounced to the far side of the cage. She ran down and rather promptly

located it. By this time she seemed to have decided that it was futile to attempt to place it in the originally selected location. She cleaned it (?) with her mouth parts, coated its exposed side and ends with a secretion from her mouth and from the bottom of the cage picked up loose bits of trash, attempting to conceal the oötheca by covering it over with them. Next she attempted to cover the oötheca with a piece of paper. It did not suit her so she discarded it. At about 3:45 A. M. she ran over to the opposite side of the cage and ate bread. After about forty-five seconds she ran up the pasteboard to the scar which she had made, chasing other females away if they ventured too near. In the meantime one of the other females began to chew at the oötheca as it lay unprotected upon the floor of the cage. Being anxious to preserve it, I opened the cage, carefully lifted the oötheca out, immersed it into water and placed it into the scar, for the mother had left the scar when I opened the cage.

At about 4:30 A. M. she returned to the oötheca in the scar, discovered its presence there by feeling about with her palpi, remained near it for several miutes, then left it and stood more or less at one place upon the floor of the cage, seemingly unconsciously gazing into space, occasionally rubbing the cerci and the valves of her external genitalia with the tibia of either hind leg.

Often in the natural habitat I have observed the oöthecae of this species pasted to rafters or sills and covered with bits of wood fibre which the mothers has chewed off with the mandibles. Of those species among which it is customary to deposit their oöthecae, the oöthecae are retained until places of favorable moisture and thermal conditions are found. Thus if a cage is too cold, too damp, too well lighted or too poorly provided with material suitable upon which to oviposit and for concealing of the oötheca, the mother bearing it may retain it for several days. The following observations upon retention of oöthecae by *Periplaneta americana* Linn. were made by the author of this article.

In cages in which very favorable environmental conditions prevailed ten oöthecae were deposited each one day after external appearance.

In another cage one was deposited two days after external appearance.

In another cage one was retained for six days after external appearance.

Egg masses unfavorably deposited usually are devoured by other cockroaches or even by the mother.

Not one cockroach of this species deposited an oötheca upon thin paper. I have had some imbedded into the larger pores of sponges kept saturated with water as a source of moisture in the cages. Such oöthecae were packed over with bits of sponge torn from the large piece precisely for the purpose of concealing the deposited oöthecae. Often bits of rag or bread are utilized and in several instances I have seen oöthecae of this species completely covered over and concealed by fine bits of dried cockroach dung. When no covering material is available the oöthecae may be dropped at random or simply pasted to articles and not covered.

Notes on American Rhynchophora (Col.).

By J. Wagener Green, Easton, Pennsylvania.

The Texan material cited in the following pages was collected during an expedition to that State in 1911 by Mr. H. A. Wenzel, of Philadelphia, and myself. Several weevils taken at that time have remained unnamed in our cabinets. Descriptions of these are herein presented, together with notices of two other new species and some miscellaneous observations.

Rhynchites tricarinatus new species.

Form of *bicolor*, bluish black, disk of thorax black with aeneous lustre, legs black. Body above with short erect pubescence as in *bicolor*. Head between the eyes coarsely densely punctured and longitudinally rugose; occiput smooth, with few coarse punctures; genae transversely wrinkled. Beak as long as head and thorax; coarsely, densely, rugosely punctured throughout; sulcate at the sides; tricarinate above from base to antennal insertion. Antennae inserted before the middle of beak; as compared with those of *bicolor*, joints three, four and five are more slender and elong-

ate, seven and eight are much wider, the club is shorter, its joints all strongly transverse, the terminal joint being small and triangular in profile.

Prothorax slightly wider than long; shining; coarsely, irregularly and not very closely punctate; widest at basal third; apical constriction not evident; sides straight and oblique from apical angles to middle, then strongly arcuate to base. Proepimera separated by centro-sternal piece.

Elytra with indistinct and confused rows of moderate punctures, the intervals flat and sparsely finely punctate.

Tarsi slender; third joint small, its lobes very narrow, about half as wide as the terminal joint at apex; nodiform enlargement at the base of the terminal joint nearly attaining the apex of the third joint. Length (excluding beak) 4 to 4.8 mm.

Described from a series of nineteen specimens collected by Mr. John Woodgate in the Jemez Mountains, New Mexico, May 20 to June 10. Related to *bicolor* but very distinct in antennal and tarsal structure.

Rhynchites bicolor Fab.

It is my opinion that some of the forms listed as varieties of *bicolor* by Pierce are capable of specific definition by means of constant structural and sculptural differences. An examination of *wickhami* and *bicolor* in my limited material shows the terminal joint of the antennal club to be consistently more elongate in the latter. Also the outer funicular joints exhibit considerable variation, some of which is probably sexual. This I have been unable to determine. In addition to the differences pointed out by Cockerell, *wickhami* has the sides of the thorax more strongly rounded and converging toward base and apex, and the femora smooth, shining and more sparsely punctate. There is room for further investigation in this group by those possessing sufficient material, and especial attention should be given the secondary sexual modifications of the antennae and rostrum.

LeConte states that the beak of the female of *bicolor* is shorter than that of the male. I have noticed that specimens with the longer beaks always have a more convex abdomen, and if these are males it is certainly contrary to the usual rule in the Rhynchophorous series.

Minyomerus conicollis new species.

Elongate, convex, densely covered with gray and darker scales which

completely conceal the surface sculpture, scales white on the declivous sides of the pronotum. Head and beak very broad, convex; surface apparently smooth; sparsely clothed with minute, suberect, squamiform setae; eyes small, rounded, rather prominent, coarsely granulated. Beak with an inverted V-shaped impression, the branches directed toward the apical angles; apex trisinuate; scrobes long and well-defined, somewhat S-shaped, becoming shallower posteriorly, terminating below the front margin of the eyes. Mentum large, transverse, completely filling the gular cavity, a small punctiform impression each side. Antennae dark, sparsely setose; scape abruptly clavate, reaching nearly to middle of eyes; funicle seven-jointed, first joint elongate, feebly clavate, equal in length to the two following joints, second joint longer than third, last four subequal, as wide as long; club elongate-oval, pubescent.

Thorax slightly wider than long; without ocular lobes, vibrissae not prominent; sides feebly arcuate, widest just before middle, thence straight to base; apex arcuate-truncate, base squarely truncate, distinctly narrower than apex. Disk of thorax vaguely rugulose, a transverse impression faintly indicated at apical fourth; suberect scales very small and inconspicuous except a basal and apical fringe.

Elytra elongate, oval, as wide as the thorax at base; widest at middle where they are nearly one-half wider than the thorax; humeri broadly rounded, angles absent; sides regularly arcuate; striae indicated by a feeble convexity of the intervals, these each bearing a single row of distant, semi-erect, setiform scales; strial punctures scarcely evident; elytral declivity oblique. There is a small shallow pit near the side margin of the elytra in front of the hind coxae which appears to be for the reception of the middle knees.

Legs and abdomen with semi-erect scales similar to those of the upper surface. Legs short; basal joints of tarsi subequal, second shortest, third broader and bilobed, fourth nearly as long as the others together. Length 2.9 to 3.2 mm.

Described from three specimens taken in the arid region south of Alpine, Texas, toward the Chisos Mountains, July 15. This species has the appearance of a small *Elissa*. The shorter basal joint of the tarsi and less prominent vibrissae, however, indicate its position in *Minyomerus*. The two genera are very feebly differentiated by the published characters. *Conicollis* may be distinguished from our other two species of *Minyomerus* by the shape of the thorax. There are undoubtedly a number of still undescribed species in this genus.

Pandeleteius spatulatus new species.

Form nearly as in *robustus*. Upper surface with pale gray and darker scales intermixed, the gray usually predominating, the elytra sometimes

show a pale transverse fascia each side just before the middle; setae exceedingly minute and inconspicuous. Beak triangularly emarginate at apex, with distinct nasal plate which is asymmetrically emarginate apically; beak feebly concave above and with median impressed line; scrobes short, directed at lower edge of eyes but not attaining them. Funicle seven-jointed, first joint slightly longer than the two following joints.

Thorax convex, as long as wide, with feeble basal and apical constrictions; sides strongly arcuate.

Elytra one-fifth wider than the thorax at base, gradually increasing in width to just beyond middle, thence narrowing to apex; humeri not at all prominent.

Fore coxae separated by about twice the distance between the middle coxae, more distant in the female. Fore femora very stout, the tibiae bent inwardly at apex, their inner margins denticulate and not appreciably sinuate. Scales of under surface mostly gray. Length 4 to 5.3 mm.

♂. Hind tibiae clavate, widest at apical third; lower surface of tibia convex and normally clothed with scales, basal half of upper surface squamose, the apical half with a large smooth concavity bearing a few scattered hairs. First ventral suture nearly straight, last segment normal.

♀. Hind tibiae unmodified. First ventral suture angulate at middle, ast segment strongly convex in transverse section.

Eleven specimens taken in the Chisos Mountains, Texas, July 19. There are two males in the collection of the Philadelphia Academy of Natural Sciences donated by Mr. Wenzel. Very distinct by the secondary sexual characters from anything heretofore described. It belongs near *robustus*, which is a larger, more mottled species and has the pronotum bisinuate in longitudinal profile, while in *spatulatus* this is evenly arcuate.

Pandeleteius defectus new species.

Much like *hilaris* in size and general appearance, mottled with gray and brown scales, darker each side of the scutellum and on an indistinct fascia beyond middle of elytra. Upper surface with inconspicuous recumbent setae, more noticeable on elytral apex. Beak very feebly concave, with median impressed line; apex slightly emarginate, the nasal plate prolonged forward between the mandibles as in *hilaris*, but larger and more obtuse; scrobes arcuate, passing beneath the eyes. Antennae with six-jointed funicle, the joints all elongate, first subequal to next two, last nearly as wide as long; club as long as five preceding joints.

Thorax longer than wide, with distinct subapical and basal constrictions; sides moderately rounded.

Elytra much wider at base than the thorax, humeri prominent. Fore coxae separated by a distance which is somewhat less than twice the dis-

tance between the middle coxae. Fore tibiae denticulate within, not sinuate, slightly bent at apex, the femora only moderately enlarged. Length 4.8 mm.

One specimen, Chisos Mountains, Texas, July 22. According to the latest synoptic table of *Pandeleteius*, *defectus* would be placed near *rotundicollis* Fall, on account of the six-jointed funicle. Otherwise the two species have nothing in common. In *rotundicollis* the anterior femora are much more strongly dilated, the corresponding tibiae longer and more slender, the head more concave, and the outer funicular joints transverse and moniliform. In habitus the two species are altogether dissimilar. It would seem a better plan to subdivide the genus primarily on the form of the nasal plate, thus establishing a number of groups and giving a more natural arrangement of the species. By this method such aberrant forms as *submetallicus* would be isolated and the species described above would be associated with *hilaris*, which it closely resembles.

Isodrusus debilis Sharp.

This species was described from San Geronimo, Guatemala. I have eight specimens of an *Isodrusus* from the Davis Mountains, Texas, July 9, which agree in every particular with the description of *debilis* in the "Biologia." *Debilis* has the appearance of a small *Pandeleteius* with the body above and the legs sparsely clothed throughout with short recurved setae. The legs are short, the fore tibiae normal and not denticulate within, and the claws are connate at base.

Otidocephalus ruficornis Casey.

Three specimens apparently belonging here were taken in the Chisos Mountains, Brewster County, Texas, July 18. They fit Col. Casey's description completely as to size, vestiture and sculpture but are differently colored. The body is black; the head, beak, antennae and prothorax dark rufous; the legs very dark ferruginous with the femora, especially the first two pairs, paler on basal two-thirds. I can find no tangible difference between this series and authentic speci-

mens of *ruficornis*, so conclude that they are only entitled to varietal rank. I propose the name **semirufus** for this form.

Tychius armatus new species.

Elongate-oval, convex, robust, black, moderately densely clothed with narrow grayish scales not concealing the surface sculpture above, the scales of elytra being longer and more slender, those of the striae very fine and setiform; erect setae absent. Beak stout, one-fifth shorter than prothorax; feebly arcuate, slightly tapering and flattened towards apex; densely squamulose below antennal insertion, glabrous at tip; punctures confluent longitudinally; apex smooth at middle. Antennae inserted at apical two-fifths of beak; color dark, scape reddish, not attaining the eyes; funicle seven-jointed, second joint two-fifths shorter than first, longer than third, outer joints subequal, last two slightly transverse; club elongate-oval, scarcely pointed, nearly as long as five preceding joints.

Prothorax slightly wider than long; sides nearly straight and subparallel from base to beyond middle, thence strongly converging to apex; apical constriction indicated by a feeble sinuation; base twice as wide as apex; disk with large, circular, moderately dense punctures.

Elytra nearly one-half longer than wide, more than twice as long as the pronotum and one-third wider at the humeri; sides parallel, broadly rounded behind; tip of pygidium visible, the elytral apices being very feebly separately rounded; disk striate, the intervals finely irregularly punctured; vestiture nearly uniform in distribution, a little denser on the sutural interval.

Femora strongly clavate, deeply notched within at apex, the middle and hind pairs distinctly toothed, the fore pair feebly so. Length 3.8 mm., width 2 mm.

Six specimens from Graybeard Mountain, North Carolina, June 19 to 25, in the cabinet of Mr. Wenzel, who has kindly permitted me to retain a pair in my own collection. They were collected by Mr. Wm. Beutenmuller. *Armatus* belongs to Casey's Group I and is easily distinguished from the other species assigned thereto by all the femora being toothed. It should follow *sordidus* in a cabinet arrangement. The type described above is a male. The rostrum of the female is as long as the prothorax, more slender, nearly cylindrical, very feebly tapering at apex, and the point of antennal insertion is a little less apical.

Tychius suturalis Schaeffer.

Specimens collected in the Davis Mountains, Texas, July 9, were identified as *T. suturalis* for Mr. Wenzel by Col. Casey.

They correspond closely with Mr. Schaeffer's description with one exception: the antennal funicle has six instead of seven joints. A single example from the Huachucha Mountains, Arizona, shows the same structure.

Aulobaris elongatus new species.

Elongate-oval, shining, black throughout. Head finely punctulate. Beak a little shorter than head and thorax, regularly arcuate, finely punctured, coarsely at the sides below antennal insertion. Second joint of funicle one-half as long as the first, scarcely as long as the two following joints together; joints three and four, slightly longer than wide, five and six shorter and quadrate, seven transverse; club as long as four preceding joints.

Prothorax one-sixth wider than long, the apical constriction almost obsolete; apex one-half the basal width; sides nearly straight and feebly converging from basal angles to middle, thence strongly arcuate to apex. Disk of thorax with coarse, deep, rounded punctures separated by their own diameters or less and becoming obliquely confluent at the sides; median impunctate line not distinct; basal lobe very small. Scutellum coarsely punctured. Prosternal groove normal, the sides not produced inwardly before the coxae.

Elytra three-fourths longer than thorax, widest at the humeri where they are slightly wider than the thorax; sides straight and feebly converging two-thirds to apex; disk moderately striate, intervals three to five times as wide as the grooves, each with a single fairly regular series of coarse rounded punctures but little smaller than those of the thorax. Length 3.5 to 4.1 mm.

Three specimens, Macdona, Texas, July 29. *Elongatus* would be placed near *ibis* in a synoptic arrangement of our species. The latter is easily separated by the distinct subapical constriction and the much finer elytral punctures.

Centrinus falsus Lec.

I have taken two specimens of this species at Mauch Chunk, Pennsylvania, August 10, which agree in every respect with the form so named in the Horn collection. My specimens are both males and have the antennal formation of *Odontocorynus*, namely the enlarged and concave apical funicular joints and the polished basal area of the club provided with a dentiform process. On each side of the prothorax immediately behind the apical margin there is a small polished tubercle. This character is unique among our species of

Odontocorynus, although it occurs in the Mexican *creperus* Boh. and *latiscapus* Champ. Blatchley and Leng accord *Odontocorynus* generic rank and separate it from *Centrinus* by the exposed pygidium and the modified male antennae. The pygidium in *C. falsus* is as completely hidden as in any true *Centrinus*, hence *Odontocorynus* must be considered merely a subdivision of *Centrinus*, as treated by Casey in his revision of the Barini, unless a third genus be erected for *C. falsus* based on the tuberculate thorax. This, of course, is not advisable.

Zygobaris centrinoides new species.

Body entirely black, shining, subrhomboidal. Head finely, sparsely punctulate, beneath with a punctiform fovea near base. Beak long and slender, regularly arcuate, nearly cylindrical; very little enlarged at base and less so at apex; finely and sparsely punctured, more coarsely and densely behind antennal insertion, an impunctate median line on basal half, a small longitudinal impression above the base of each mandible. Beak equal in length to the head and prothorax, separated from the head by an abrupt bisinuate declivity. Mandibles stout, curved, notched within. Antennae inserted just behind middle of beak; scape almost attaining the eyes; first joint of funicle a little longer than the next two joints combined, second joint one-half longer than the third, three to seven subequal, the outer joints transverse; club elongate-oval, pubescent throughout, more sparsely so at base, as long as the preceding five joints, first joint comprising much less than half of mass.

Pronotum wider than long, as wide as the elytra at base; sides regularly arcuate; subapical constriction feeble; apex much less than half as wide as base, the latter nearly straight and with a small ante-scutellar lobe; disk glabrous at middle, sparsely punctured, more densely toward base, median line smooth; pronotum at the sides coarsely closely punctate, each puncture bearing an elongate, white, decumbent, hair-like squamule arranged transversely; a few small scattered scales along the middle of the basal thoracic margin. Scutellum quadrate, glabrous.

Elytra more than twice as long as the pronotum; widest at basal tenth, thence straight to beyond middle, then evenly rounded to apex; apices conjointly rounded, completely concealing the pygidium; striae regular, entire, moderately deeply impressed, very minutely and distantly punctulate; intervals flat, much wider than the striae, each with a single irregular series of shallow punctures, becoming confused and somewhat biseriate toward base; each puncture of the intervals bears an elongate white scale similar to those at the sides of the prothorax.

Body beneath sparsely squamose, scales smaller and more slender than those of the upper surface, condensed on the prosternum before and be-

tween the coxae. Prosternum abruptly deeply sulcate on the apical constriction, with distinct delimiting lateral ridges; convexly prominent each side before the coxae; the median sulcus becoming gradually evanescent posteriorly so that the prosternum is only very slightly concave between the coxae. Ventral segments 2, 3 and 4 abruptly declivous on hind margin, the segment following each commencing on a lower plane.

Fore coxae separated by about half their width, the others more widely distant. Tibiae carinate externally; middle and hind tibiae slightly expanded at tip, the latter pair with a small tooth on the inner side at apex, the others strongly mucronate. Tarsi long and slender, densely pubescent beneath; subequal to the tibiae; third joint bilobed; last joint elongate, nearly as long as the remainder, bearing two claws which are connate at basal third, the suture evident. Length 3 mm., width 1.8 mm.

The specimen described above is a female taken at Marfa, Texas, July 12. Mr. Wenzel has a male from Davis Mountains, Texas, which differs in the shorter, stouter, more coarsely punctured beak, the antennae inserted at the middle, where there is a very slight lateral enlargement; the front coxae more widely separated; the first ventral segment somewhat concave at middle; and the pronotum more coarsely punctured.

Centrinoides is a more squamose species than any previously described *Zygobaris* and may possibly not be congeneric with *nitens* Lec. and *xanthoxyli* Pierce, which I have not seen.

The type of this species as well as the types of the other new species described in this paper are in my cabinet.

An Appreciation (Diptera).

The work of Dr. Alvah Peterson on *The Headcapsule and Mouth-parts of Diptera*, in the Illinois Biological Monographs, vol. iii, No. 2, has received an appreciative notice from Dr. A. D. Imms in the *Entomologist's Monthly Magazine* (London) for May, 1920.

Sad but Familiar.

A recent number of the Bulletin of the Entomological Society of France (1920, No. 4) announces that, as a measure of economy, it has been decided to reduce the covers to four pages and to replace the table of contents with advertisements; that in the future the Society can only accept line drawings; photographs and drawings necessitating half-tones will be reproduced only at the expense of the authors.

ENTOMOLOGICAL NEWS

PHILADELPHIA, PA., JULY, 1920.

LABELS ON SPECIMENS.

Insects at the present time have so many relationships to other objects that it is important to know the exact locality and date of capture of a given specimen. The altitude and any other available information is also important for proper study and the altitude should also be given, when not readily ascertainable from other sources. These days few of us are satisfied with a specimen without locality and "Africa" or the "East Indies" hardly suffices. The museum curator has many troubles in regard to data. Specimens come to us without data, with insufficient data and with inaccurate dates and localities. Often the writing on the labels or papers is only translatable by the person writing them and possibly not even by the one writing them. In papered specimens it is a great convenience to have the data on each paper so that they may be arranged in various boxes systematically, to be spread at a later date.

The rule should be to place on each specimen or each papered specimen, the exact locality, date of capture, altitude and name of the collector, and any or all data should be legibly written and if you can't write legibly print them. The name of the month should be written in full or expressed in Roman numerals, otherwise there is uncertainty and trouble. When the collector is spending days or weeks in the field, time may be saved by dating specimens and keeping a combined itinerary and diary and adding full data when there is more leisure. It is by no means uncommon for authors and collectors to give the names of obscure places, omitting the country, and thus making it difficult and wasteful of time to find out whence came the specimens. There are few of us that know where all the towns, villages and hamlets of the world are located and it is a double disappointment not to find some of these names in the gazetteer or on the map.

There is a large amount of carelessness in regard to data and much time is wasted owing to slipshod methods, not to speak of the possibility of introducing profanity into the vocabulary of your correspondents or among those who eventually must receive and care for the specimens.—H. S.

Prof. V. L. Kellogg to leave Stanford University

It is announced that Prof. Vernon Kellogg will resign his professorship of entomology in Stanford University, July 1, 1920, in order to undertake the permanent secretaryship of the National Research Council, to which latter organization he will thereby insure some degree of administrative continuity. It will be recalled that Prof. Kellogg took an active part in relief work in Europe preceding and during the recent war, to which Minister Brand Whitlock pays an appropriate tribute in his recent book on Belgium. It is to be hoped that this change will not withdraw Prof. Kellogg permanently from entomology.

Return of the Williamson-University of Michigan Expedition from Venezuela.

The *Evening News* of Bluffton, Indina, for May 17, 1920, announces the return to that city of Mr. E. B. Williamson, whose expedition to Venezuela has been mentioned in earlier numbers of the NEWS for the present year (pages 108,141). With E. B. and J. Williamson, were associated H. B. Baker, of the University of Michigan, who collected reptiles, snails, shells, ants and other insects, and Will Ditzler, of Bluffton. Mr. Williamson experienced several attacks of malaria and of fly larvae in the intestines. In addition to the localities already noted in the NEWS, collections were made at Boqueron, Maracaibo, Encontrados, Tachira at the foot of the Andes, La Fria and El Guayabo on the Rio Zulia. The Odonata brought back consist of 158 species and 12,411 specimens.

Entomological Literature.

COMPILED BY E. T. CRESSON, JR., AND J. A. G. REHN.

Under the above head it is intended to note papers received at the Academy of Natural Sciences, of Philadelphia, pertaining to the Entomology of the Americas (North and South), including Arachnida and Myriopoda. Articles irrelevant to American entomology will not be noted; but contributions to anatomy, physiology and embryology of insects, however, whether relating to American or exotic species, will be recorded.

The numbers in HEAVY-FACED TYPE refer to the journals, as numbered in the following list, in which the papers are published.

All continued papers, with few exceptions, are recorded only at their first installments.

The records of papers containing new genera or species occurring north of Mexico are all grouped at the end of each Order of which they treat.

For records of Economic Literature, see the Experiment Station Record, Office of Experiment Stations, Washington. Also Review of Applied Entomology, Series A, London. For records of papers on Medical Entomology, see Review of Applied Entomology, Series B.

2—Transactions of the American Entomological Society, Philadelphia. **4**—Canadian Entomologist, London, Canada. **5**—Psyche, Cambridge,

Mass. **8**—The Entomologist's Monthly Magazine, London. **9**—The Entomologist, London. **17**—Lepidoptera, Boston, Mass. **20**—Bulletin de la Societe Entomologique de France, Paris. **32**—Insecta, Revue Illustree d'Entomologie. Rennes. **34**—Bulletin de la Societe Entomologique de Belgique, Brussels. **45**—Zeitschrift fur wissenschaftliche Insektenbiologie, Berlin. **52**—Zoologischer Anzeiger, Leipsic. **67**—Le Naturaliste Canadien, Quebec. **69**—Comptes Rendus des Seances de l'Academie des Sciences, Paris. **77**—Comptes Rendus des Seances de la Societe de Biologie Paris. **81**—The Journal of Parasitology, Urbana Illinois. **86**—The Quarterly Journal of Microscopical Science, London. **87**—Arkiv for Zoologi K. Svenska Vetenskapsakademien Stockholm. **89**—Zoologische Jahrbucher, Jena. **100**—Biological Bulletin of the Marine Biological Laboratory, Woods Hole, Mass. **108**—Journal of Genetics, Cambridge, England. **109**—Annales Historico-Naturales Musei Nationalis Hungarici, Budapest. **110**—Naturwissenschaftliche Wochenschrift, Jena.

GENERAL. Andrews, H. V.—Amyl acetate [for mounting and sugaring]. **17,** iv, 33–4. **Chodat et Carisso.**—Une nouvelle theorie de la myrmecophilie. (Com. Rendu, Soc. Phys. Hist. Nat., Geneve, xxxvii, 9–12). **Crampton, G. C.**—A comparison of the external anatomy of the lower Lepidoptera and Trichoptera from the standpoint of phylogeny. A comparison of the genitalia of male hymenoptera, Mecoptera, Neuroptera, Diptera . . with those of lower insects. **5,** xxvii, 23–34; 34–45. **Curran, C. H.**—A plea for definitiveness. **4** lii, 120. **Heikertinger, F.**—Exakte begriffsfassung und terminologie im problem der mimikry und verwandter erscheinung. **45,** xv, 162–74. **Hewitt, C. G.**—Obituary and bibliography. **4,** lii, 97–105. **Krogh, A.**—Studien ueber tracheenrespiration. (Pfluger Arch. Ges. Physiol. Mens. u. d. Tiere, Berlin, clxxix, 95–120.) **Merle, R.**—Production de mouches a cornes. (La Nature, Paris, 1920, 143 -4). **Step, E.**—Insect artizans and their work, (New York, Dodd, Mead & Company, n. d.) **Warren, E.**—(see under Neuroptera.

ARACHNIDA &c. Emerton, J. H.—Catalogue of the spiders of Canada known to the year 1919. (Trans. Royal Canadian Inst., xii, 309–338). **Gunthrop, H.**—Summary of Wood's Myriapoda papers. **4,** lii, 112–14. **Hirst, S.**—Studies on Acari. The genus Demodex. (Br. Mus. Nat. Hist., 44 pp.).

NEUROPTERA. Ast, F.—Ueber den feineren bau der facettenaugen bei neuropteren. **89,** xli, Abt. f. Anat., 411–58. **Enderlein, G.**—Ueber einige subantarktische Mallophagen. **52,** xlix, 241–51. **Howe, R. H.**—Odonata of Chatham, Mass. **5,** xxvii, 55–8. **Lacroix, J. L.**—Sur quelques anomalies dans la nervulation chez les Chrysopides. **20,** 1920, 85–7. **Warren, E.**—Termites and termitophiles. (South African Jour. Sci., 1919, xvi, 92–112).

ORTHOPTERA. Beck, H.—Die entwicklung des flugelgeaders bei Phyllodromia germanica. **89.** xli, Abt. f. Anat., 376–410.

Enderlein, G. Neue, neotropische Pseudophyllinen **52,** xlix, 17-20.

HEMIPTERA. Barber, G. W.—Concerning the distribution of the North Am. Cicadellidae. **4,** lii, 116–18. **de Bergevin, E.**—Note sur un Jasside, Eutettix osborni, de l'Amerique du Nord. **20,** 1920, 82–3. **Distant, W.L.**—On a small collection of Homoptera from British Guiana. **9,** liii, 124–6. **Doncaster & Cannon.**—On the spermatogenesis of the louse (Pediculus) with some observations on the maturation of the egg. **86,** lxiv, 303–28. **Enderlein, G.**—Psyllidologica. **52,** xlix, 344–52. **Horvath, G.**—Analecta ad cognitionem Cydnidarum. **109,** xvii, 205–73. **Leon, N.**—Quelques observations sur les Pediculides. **81,** vi, 144–7.

LEPIDOPTERA. Dognin, P.—Heteroceres nouveaux de l'Amerique du Sud. Fasc. 18. **Eggers, F.**—Das thoracale bitympanale organeiner gruppe der L. Heterocera. **89,** xli, Abt. f. Anat., 273–376. **Onslow, H.**—The inheritance of wing colour in L. **108,** ix, 339–46. **Shufeldt, R. W.**—The fall web worm and the swallowtails. (Amer. Forestry, xxvi, 364–69).

DIPTERA. Chapais, J. C.—Une courte etude concernant quelques cecidomyies. **67,** xlvi, 247–53. **Collin, J. E.**—Eumerus strigatus and tuberculatus. **8,** 1920, 102–6. **Edwards, F. W.**—"Collecting fungus-gnats": Remarks on C. Morley's paper. **9,** liii, 126–7. **Enderlein, G.**—Dipterologische notizen. **52,** xlix, 57–72. **Garrett, C. B. D.**—East Kootenay diptera. Tipulidae—1. **4,** lii, 108. **Hearle, E.**—Notes on some mosquitoes new to Canada. **4,** lii, 114–16. **Imms, A. D.**—Recent.. research on the head and mouth parts of Diptera. **8,** 1920, 106–9. **Lichtwardt, B.**—Die Nemistriniden des Ungarischen national museums in Budapest. **109,** xvii, 274–8. **Lutz & Lima,**—Contribuicao para estudodas Tripaneidas (moscas de frutas) Brazileiras. (Mem. Inst. Oswaldo Cruz, x, 5–15, 1918). **Pantel, J.**—Precisions nouvelles sur la region posterieur du vaisseau dorsal des larves des muscides. (La Cellule, Lierre, xxix, 381–88). **Thompson, W. R.**—Sur les dipteres parasites des Isopodes terrestris. **77,** lxxxiii, 450–1.

Alexander, C. P.—New Nearctic crane flies. **4,** lii, 109–12. **Malloch, J. R.**—Descriptions of new North American Anthomyiidae. **2,** xlvi, 133–96.

COLEOPTERA. Aurivillius, C.—Wissenschaftliche ergebnisse der schwedischen entomologischen reise des A. Roman in Amazonas. **87,** xii, No. 11. **Bertin, L.**—Remarques sur pieces buccales et l'alimentation des Coleopteres Lamellicornes. **69,** 1920, 1131–33. **Bordas, L.**—Considerations generales sur la biologie du Rhynchites conicus et anatomie de la larve. **32,** 1919, 196–201. **Hess, W. N.**—Notes on the biology of some common Lampyridae. **100,** xxxviii, 39–76. **d'Orchymont, A.**—Remarques au sujet des premiers etats du genre Brachynus. **34,** ii, 59–61. **Spaeth, F.**—Neue Cassidinen aus der sammlung von K. Brancsik &c. (Some Neotropical). **109,** xvii, 184–204.

Chittenden, F. H.—Description of a new species of Sphenophorus from Florida. (Jour. Wash. Acad. Sci., x, 313–14).

HYMENOPTERA. Brues, C. T.—The braconid genus Trachypetus. **5,** xxvii, 59–62. **Brunnich, K.**—Zur frage der geschlechtsbestimmung bei den bienen. **45,** xv, 188–9. **Hase, A.**—Ueber den putzvorgang bei der schlupfwespe Lariophagus distinguendus. **110,** xix, 81–7. **Smith, E. J.**—Removing pollen from bees. **4,** lii, 116. **Wheeler, W. M.**—The subfamilies of Formicidae, and other taxonomic notes. **5,** xxvii, 46–55.

Bradley, J. C.—Descriptions, records and notes on North American Nyssonidae. **2,** xlvi, 113–32.

Insect Behavior. By Paul Griswold Howes. With illustrations from Photographs by the Author. Richard G. Badger. The Gorham Press. Boston. $6.00 net.—This work is printed in large readable type and contains 172 pages and a large number of admirable halftone illustrations (114) which are original. The author mentions the work as being written in a light enough vein to be entertaining to the reader, however casually interested he may be in insect life, but at the same time, one that is in every way scientifically accurate. Chapters two to eight inclusive treat exclusively of South American insects, studied in the jungles of British Guiana. This is the most valuable part of the book. The remainder of the work is nearly all devoted to the insects of the Eastern United States. There seems to be a tendecy in such books to become a bit poetical and overlook sometimes that which is in "every way scientifically accurate," for instance "when the eggs have given birth to their curious children." "The chrysalis of a butterfly . . . a species of *Vanessa* . . . it cannot thrash around and make a demonstration." What the chrysalis of *Vanessa antiopa* really does when disturbed is thrash around and make a big demonstration. The lay reader might infer that the great cecropia moth feeds on the newly opened blossoms, but the ones we have seen had no mouth parts for such a purpose. We are quite sure that its eggs do not "split open in the center," at least ours never did. We have never seen "the convenient spot in the corner or the under side of the piece of old lumber where the cecropia makes its cocoon." In spite of some poetical (?) licenses the book is an excellent one in its field. H. S.

Manual of the Odonata of New England by Dr. R. Heber Howe, Jr. Memoirs of the Thoreau Museum of Natural History: II. 1917–1920. Concord, Massachusetts. $1.35.—In this handy manual nature lovers in the northeastern states have now a brief introduction to the dragonflies of their region which makes a knowledge of the names of these interesting insects available to any who may wish to be properly introduced to them.

In its first form Dr. Howe's "Manual of the Odonata of New England" appears in six parts totaling one hundred and two pages and having over three hundred illustrations. The outstanding excellencies are the following:

1. It is the first manual of the Odonata in the United States that covers more than a single state.

2. It is the first manual of Odonata of any extensive region that seriously attempts to give adequate figures of all the species listed.

3. It has an illustrated key, such as some popular ornithologies have found useful, which illustrates the characters that it uses, *where they are used.* This brings the key directly down to the reader as nothing else does and next to the figures of specific characters, this is the most valuable feature of the work.

Under each genus Dr. Howe gives a table showing the New England States from which each species has been recorded. The reviewer wishes to suggest that such a table can have little value as these are political regions while it is the physiographic and climatic areas that control distribution. The same amount of space devoted to remarks on the faunas represented in New England and their distribution would at least have been more interesting reading.

This distributional problem is one of peculiar interest in New England as it lies where four fairly definite faunas overlap. The one hundred and fifty-six species listed by Dr. Howe can be divided roughly among these faunas about as follows:

1. Canadian fauna, forty-four species. These genera are holarctic in distribution and probably Eurasian in origin perhaps having spread into North America during recent interglacial epochs. This was probably the first fauna to appear in New England after the retreat of the ice and is characterized by *Lestes* 4 spp., *Aeschna* 10 spp., *Somatochlora* 10 spp., *Leucorhinia* 5 spp., and *Sympetrum* 5 spp. It occupies the hilly back bone of the region.[1]

2. Transition fauna, twenty-five species. These genera occupy rough country and rapid gravelly streams of boggy land. These are characteristic of the central Appalachian System and among them are many rare and odd species as this is the oldest North American fauna, possibly a relic of pre-Pliocene times, whose species manage to hang on by living in special habitats that as yet are not seriously invaded by more modern faunas. In it are *Chromagrion*, *Tachopteryx*, *Cordulegaster*, 2 spp., *Ophiogomphus*, 5 spp., *Lanthus*, 2 spp., *Gomphaeschna*, *Didymops*, *Williamsonia*, *Helocordulia* and *Dorocordulia*.

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[1]This and the following statements of distribution and habitat are obviously of necessity very broad. Any local fauna will give various apparent exceptions.

3. Upper Austral, sixty-eight species. This is the great Mississippi Valley fauna of ponds and muddy streams, a very modern fauna of close species, which is at present overflowing into the warmer parts of New England. It is characterized by *Argia* 2 spp., *Enallagma* 12 spp., *Gomphus* 12 spp., *Libellula* 4 spp., and *Tetragóneuria* 3 spp., *etc.*

4. Lower Austral, nineteen species. All are odds and ends, the pioneers of a very modern fauna such as *Ischnura ramburi*, *Micrathyria*, *Libellula* and *Tramea*, which have slipped up the narrow, warm coast from the semi-tropical gulf. In this group are a few species which are interesting because they are able to inhabit brackish water alongside a true marine fauna of crabs and other hideous creatures. Such are *Enallagma durum*, *Ischnura ramburi*, *Micrathyria berenice*, *Anax junius*, etc. This Lower Austral fauna scatters into southern New England and a few species manage to round the cape and get as far as the coast of southern Maine. This fauna must be increasing at present.

Opportunities at such problems on faunas, which are undoubtably shifting, make all Odonate records in New England of great value, for which reason Dr. Howe's manual is especially opportune.

The reviewer feels that in any manual of this type there should be added to the key and illustrations brief descriptions that contain the more conspicuous specific characters to satisfy that innate craving of the human mind for a check on the correctness of an identification. Such descriptions are lacking, probably through necessity. Further, in some of the genera, particularly *Enallagma* and *Gomphus*, the figures are hardly sufficient to positively identify some of the difficult species, for in these genera species are difficult even when illustrated with the clearcut line drawings so well developed in the writings of Calvert and of Williamson.

Altogether the Manual is a credit to the industry of Dr. Howe and undoubtably pleasing to the spirit of the critical Thoreau.—C. H. Kennedy, Ohio State University, Columbus, Ohio.

An Introduction to Entomology by John Henry Comstock, Professor of Entomology and General Invertebrate Zoology, Emeritus, in Cornell University. Second Edition, entirely rewritten. Ithaca, N. Y. The Comstock Publishing Co. 1920. Part I, 8vo. Pp xix, 220. 220 text figs. $2.50.

Professor Comstock is, we believe, fully entitled to the first place in Entomology in America. He has signalized his Emeritusship and the years immediately preceding by the publication of a surprising number of important and comprehensive texts and handbooks. It is sufficient to mention *The Spider Book* (1912), *The Wings of Insects* (1918) and now the present volume. In the preface to the last, dated from Cornell, June, 1919, he writes:

"The following pages constitute the first part of a text book of entomology that the writer has in preparation. This first part is published in advance of the completion of the entire work in response to the request

of some teachers who desire that it be available for the use of their classes. The early publication of this part of the book will not only render it immediately available but will also afford an opportunity for the suggestion of desirable changes to be made before it is incorporated in the complete work. Such suggestions are earnestly invited by the writer. In writing this text-book much use has been made of material published in my earlier works, notably in 'An Introduction to Entomology' published in 1888 and long out of print, 'A Manual for the Study of Insects,' in the preparation of which I was aided by Mrs. Comstock, and in 'The Wings of Insects,' more recently published. The more important of the other sources from which material has been drawn are indicated in the text and in the bibliography at the end of the volume."

A comparison of the scope of the present work with that of the *Manual* is at once suggested. In the fourth edition (1901) of the latter, chapters I, Zoological Classification and Zoological Nomenclature; II, Insects and their Near Relatives and as much of III, Class Hexapoda or Insects, as deals with the characteristics of the class and the external and internal anatomy of insects, occupy 76 pages, the following 600, as far as the index, treat successively of the different orders. If from those 76 pages we subtract 8, or chapter I, the remaining 68 will in subject matter correspond to the present work. Each topic, consequently is considered here in much greater detail and one is naturally led to another comparison—with the late Professor Packard's *Text Book of Entomology*, which is very similar in its scope and still more detailed in virtue of its 729 pages and 654 text figures.

The special title of the present Part I is "The Structure and Metamorphoses of Insects." There are four chapters, each with many subdivisions: I. The Characteristics of Insects and Their Near Relatives (28 pp.); II. The External Anatomy of Insects (66 pp.); III. The Internal Anatomy of Insects (73 pp.); IV. The Metamorphosis of Insects (38 pp.).

An excellent selection of topics treated and topics omitted has been made, the typography is pleasing and Professor Comstock has with good reason expressed his appreciation of his artists, Miss Stryke and Miss Edmonson. Some of the familiar figures of the *Manual* reappear, rather the worse for wear, but most of the illustrations have been newly drawn.—P. P. CALVERT

A LITTLE GATEWAY TO SCIENCE. HEXAPOD STORIES. By EDITH M. PATCH. With illustrations by Robert J. Sim. The Atlantic Monthly Press. Boston, 1920. Pp.. xvii, 179. 43 illustrations. School edition 90 cents, library edition $1.25.—The publishers state that this "little volume contains twelve stories about six-footed insects, told very simply for the very young, by a scientist who thinks that the child should be approached with the same standards of honesty as the most learned society, and that natural history facts are themselves so full of dramatic interest that they need no garnish of fiction.

The first story, "Van, the Sleepy Butterfly who was Wakened by a January Thaw," tells of Van's January experiences, of her laying eggs in May from which hatched Sister Essa and Essa's brothers and sisters; how Essa in her turn laid eggs in June from which came Opie, and of many other happenings to the three generations.

This may be taken as typical of the book which is neither technical nor sentimental and surely should appeal to the child as far as an Olympian (*sensu Kennethi Grahami*) can see. The author is the well known entomologist of the Maine State Agricultural Experiment Station so that the non-entomological public may be assured of the reliability of the book.—P. P. CALVERT. (Advertisement).

Obituary

The Reverend HENRY STEPHEN GORHAM—author of the sections on Malacodermata (1880–86) and Erotylidae, Endomychidae and Coccinellidae (1887-1889) in the Coleoptera volumes of the *Biologia Centrali-Americana*, died at Great Malvern, England, March 22, 1920. He was born in 1839, educated at Rugby under Arnold and was a civil engineer before he became a curate in the Church of England, in 1865. His entomological writings deal with British and exotic Coleoptera. His extensive collections of beetles have been widely dispersed in various public and private museums, some data on which are given in a notice in the *Entomologist's Monthly Magazine* for May, 1920, from which the above details are taken.

The same issue of the *Magazine* announces also the death of EDMUND REITTER. author of "innumerable papers" on Palaearctic Coleoptera, at Paskau, Moravia, March 15, 1920, aged 75. He was one of the original editors of the *Wiener Entomologische Zeitung* from its foundation in 1891 to his death.

The deaths of two entomologists are announced in a recent number of the *Bulletin de la Societé Entomologique de France:* EMILE BOUDIER, member of the Institute of France and oldest member of the Entomological Society in point of election (1857), who studied European Coleoptera: and J. PANTEL known for his work on comparative anatomy and general biology, especially of Orthoptera, and for his monographic essay on the parasite Tachinid larva of *Thrixion halidayanum*, (1898), at Toulouse, February 7, 1920, aged 67.

EXCHANGES.

This column is intended only for wants and exchanges, not for advertisements of goods for sale. Notices not exceeding three lines free to subscribers.

☞ These notices are continued as long as our limited space will allow; the new ones are added at the end of the column, and only when necessary those at the top (being longest in) are discontinued.

Wanted—All Saturnians, particularly Hemileucids, and material for breeding them. Offer—*Ornithoptera, Papilio, Hemileuca maia lucina, Pseudohazis eglanterina, shastaensis, hera;* Pupae of *Marumba, Sphinx cerysii* and *gordius, Panthea, Pheosia;* Ova of *Catocala relicta;* etc., and cash. J. D. Sornborger, Rowley, Mass.

Wanted—To purchase literature on Aphididae. Send list to A. C. Baker, East Falls Church, Va.

Will exchange many entomological items for others not in my library, or will buy unusual items of practical value. Can use a photomicrographic lens. J. E. Hallinen, Cooperton, Okla.

Wanted—For cash, or exchange, papers on insect biology, ecology or behavior (especially aculeate Hymenoptera). P. Rau, 2819 S. Kings highway, St. Louis, Mo.

Brachynus wanted for cash or exchange from any part of North America. J. W. Green, 520 McCartney St., Easton, Pa.

Lepidoptera Hesperidae wanted.—I will purchase or exchange and also name specimens. South American species particularly desired. Henry Skinner, Logan Square, Philadelphia, Pa.

For Exchange—Iowa Catocalae in A-1 condition. Wanted, Cocoons of Actias luna also other lepidoptera. Mrs. O. F. Hiser, Arnolds Park, Iowa.

Will go to Kauai Island, T. H., to collect insects, etc., in highest altitude, about end of April. Would like some good collector to go along for company. Have been there twice last year. Address, J. Aug. Kusche, Burlingame, San Mateo Co., Cal.

Lepidoptera—Offer many Western species and will collect next month in Colorado desert, S. E. Cal.; will exchange or purchase. Desire rarer Noctuids, fresh, full data. Chas. A. Hill, 644 West 36th St., Los Angeles, Cal.

Books Wanted—Entomological News, Vol. 11, Nos. 1, 3. 5; Vol. 14, Nos. 1, 7. Brooklyn Museum Library, Eastern Parkway and Washington Ave., Brooklyn, N. Y.

Wanted—N. A. Coleopterists interested in European Coleoptera. Liberal exchanges and friendly correspondence. Mr. C. Crozet, 155, Via Cavour, Rome, 23, Italy.

Japanese and Formosan Butterflies will be exchanged by S. Satake, 48, Aoyama-minami-machi, 5-chome Tokyo, Japan.

Wanted—To purchase or exchange papers and books on insect Biology, Ecology, and Behavior, especially aquatic Hemiptera.—C. F. Curtis Riley, Department of Forest Zoology, The New York State College of Forestry at Syracuse University, Syracuse, New York.

Wanted—North American or European Coleoptera to determine in exchange for specimens.—R. T. Garnett, 625a 14th St., Oakland, Cal.

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